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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/751,312 | 01/02/2004 | Joschp J. Schottler | P06708US0-6025 | 2007 |

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EXAMINER

CHANG, SUNRAY

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2121

DATE MAILED: 06/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/751,312

Applicant(s)

SCHOTTLER ET AL.

Examiner

Sunray Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in responsive to the paper filed on March 27th, 2006.

Claims 1 – 9 are presented for examination.

Claims 1 – 9 are rejected.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. **Claims 1 – 4 and 7 – 9 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Joseph F. McCormick (U.S. Patent No. 5,012,722, and referred to as **McCormick** hereinafter), and in view of Takano et al. (U.S. Patent No. 5,938,947, and referred to as **Takano** hereinafter).

(**McCormick** as set forth above generally discloses the basic inventions.)

Regarding independent claim 1, 8 and 9, McCormick teaches,

- A method of driving the coil of an electrohydraulic valve [Abstract, Fig. 3] with a PWM drive [Fig. 3], [see further Col. 5, Lines 14 – 27 & Col. 4, Lines 49 – 64] comprising:
- Transmitting a feedback signal to a digitizing device that is electrically connected to the electrohydraulic valve; [Col. 7, Lines 12 – 39, Fig. 8 applying the selected signal to ADC via analog line]
- Sampling the feedback signal within the digitizing device to create a plurality of signal samples; [Col. 7, Lines 58 – 61]
- Transmitting the plurality of samples to an accumulator; [loop controller receives control information indicating a desired operation of the hydraulic valve through control input, and feedback information indicating the state of various elements in the servo loop, Col. 5, Lines 16 – 20]
- Averaging the plurality of samples within the accumulator to create an average value; [operate in a desired manner, Fig.2a – 2i, Col. 4, Lines 25 – 48, Col. 5, Lines 14 – 27] and
- Transmitting the average value to a closed loop control algorithm that generates a pulse width signal to drive the coil of the electrohydraulic valve. [formula relationships or look up data tables, Col. 7, Lines 47 – 61]

McCormick does not point out clearly the “operate in a desired manner” is using “averaging, calculating the samples”

Takano teaches “averaging, calculating the samples” [Takano, Col. 6, Line 22 – Col. 8, Line 38] for the purpose of detecting a reduction in the accurately with which the welding

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current is detected, ..., controlling the welding current with a predetermined degree of accuracy even when a reduction is detected. [Col. 2, Lines 57 – 63]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **McCormick** to include the teach of **Takano**, "averaging, calculating the samples", for the purpose of detecting a reduction in the accurately with which the welding current is detected, ..., controlling the welding current with a predetermined degree of accuracy even when a reduction is detected. [Col. 2, Lines 57 – 63]

Regarding dependent claims 2 – 4,

- The digitizing device is an A/D converter, a DSP or a micro controller. [microprocessor & ADC, Col. 7, Lines 12 – 39 & 47 – 61, Fig. 8]

Regarding dependent claims 7,

- The accumulatoe resets when the algorithm sends the pulse width signal to the coil of the electrohydraulic valve. [can be accordingly adjusted approximately once every 1 ms, Col. 7, Lines 58 – 60]

3. **Claims 5 and 6 are rejected** under 35 U.S.C. 103(a) as being unpatentable over **McCormick**, and in view of Gary Bergstrom (U.S. Patent No. 6,249,418, and referred to as **Bergstrom** hereinafter).

(**McCormick** as set forth above generally discloses the basic inventions.)

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Regarding dependent claims 5 and 6,

McCormick teaches algorithms [formula relationships or look up data tables, Col. 7, Lines 47 – 61].

McCormick does not teach PID or PI.

Bergstrom teaches PID [standard closed loop controller design methods ... PID, Col. 9, Lines 63 – 65], for the purpose of generating the required force. [Col. 9, Lines 66 – 67]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **McCormick** to include the teach of **Bergstrom**, "PID", for the purpose of generating the required force. [Col. 9, Lines 66 – 67]

Response to Amendment

Claim Rejections - 35 USC § 102

4. Applicants' argument regarding McCormick fails to teach or suggest "sampling", "averaging the samples", and further "calculating an average current" which McCormick teaches "to deflect or maintain the position of the coil and operate valve as required by the control input. In turn, valve cause hydraulic pressure to operate an actuator in a desired manner" (Col. 5, Lines 14 – 27), does not clearly pointing out "calculating, averaging the samples". Yet, the purpose for "calculating, averaging the samples" of PWM is to operate an actuator in a desired manner. The examiner further cited several references which teach "calculating, averaging the samples" to show this subject matter is already well known in the art.

Further references, Suzumi et al. (U.S. Patent No. 6,859,631), Kimura et al. (U.S. Patent No. 6,801,382), Poletto, Vanni (U.S. Patent No. 6,657,575), Nakazawa, Yosuke (U.S. Patent No.

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6,580,247), Masaki et al. (U.S. Patent No. 5,414,339), Shorkey, Michael J. (U.S. Patent No. 5,381,336) and Singleton et al. (U.S. Patent No. 5,341,298), have been cited by the examiner to point out the subject matter, "averaging, calculating the samples", is well known in the art.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sunray Chang whose telephone number is (571) 272-3682. The examiner can normally be reached on M-F 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on (571) 272-3687. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-746-3506.



Anthony Knight
Supervisory Primary Examiner
Group Art Unit 2121
Technology Center 2100
U.S. Patent and Trademark Office

June 8, 2006